Combinatorially Orthogonal Graphs

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Vectors $x = (x_1, x_2, \cdots, x_n)^T$ and $y = (y_1, y_2, \cdots, y_n)^T$ are *combinatorially orthogonal* if $|\{i : x_i y_i \neq 0\}| \neq 1$. An undirected graph $G = (V, E)$ is a *combinatorially orthogonal graph* if there exists $f : V \to I\!R^k$ for some k such that for any $u, v \in V$ $uv \notin E$ iff $f(u)$ and $f(v)$ are combinatorially orthogonal. I will discuss some of the various results for combinatorially orthogonal graphs, especially paths and cycles.

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